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(72) Wada, Ichiro, JP

(72) Hisada, Kenichi, JP

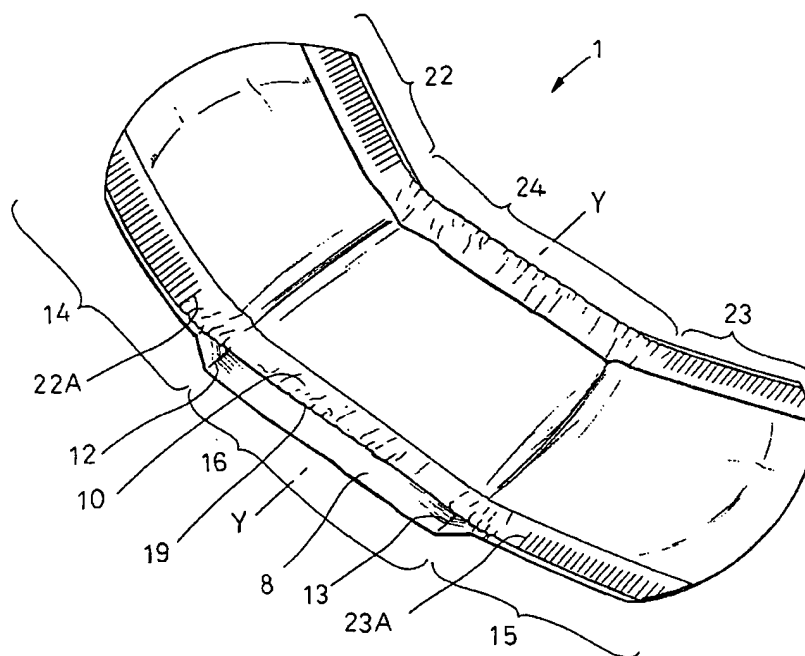
(73) Uni-Charm Corporation, JP

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(54) **SERVIETTE HYGIENIQUE**

(54) **SANITARY NAPKIN**



(57) Cette invention concerne une serviette hygiénique comportant de chaque côté des rabats étirables longitudinalement, ladite serviette étant pliée en trois le long de lignes transversales faisant toute sa largeur, rabats latéraux compris, puis placée dans une enveloppe.

(57) A sanitary napkin comprising a pair of longitudinally stretchable barrier flaps provided on either side thereof, said napkin being folded in three layers by folding back longitudinally opposite end sections thereof along lines extending transversely thereof as well as transversely extending across said barrier flaps, and said napkin being packed in an envelope.



## SANITARY NAPKIN

The present invention relates to a sanitary napkin and, more particularly, to a sanitary napkin or menstruation pad and the like  
5 individually packaged in an envelope.

Conventional sanitary napkins generally are individually packaged in an envelope for supply to consumers. As disclosed, for example, in Japanese Laid-Open Utility Model Application No. 1993-93430, some napkins have along their laterally opposite sides barrier flaps with elastic  
10 members under a tension exerted longitudinally of the napkin so that the flaps may be normally biased to contract. According to the technique disclosed in this reference, the flaps contract and rise on the skin-contacting surface of the napkin so as to form barriers preventing menstrual discharge from leaking out the sides as the napkin is worn and  
15 curves inwardly longitudinally of the napkin.

It is possible also for the existing napkin having the aforesaid barrier flaps as described above to be folded in two or three and then to package this individually for supply to consumers. Needless to say, the napkin is put in contact with the sensitive part of a wearer and therefore  
20 the elasticity of the flaps must be moderate to avoid an

apprehension that the flaps might gouge into the skin of the sensitive part. However, the napkin is relatively rigid due to the presence of the liquid-absorbent core with a compressed fluff pulp layer and, if the elasticity of the flaps is excessively low, the rigidity thereof might overwhelm the elasticity to prevent the flaps from sufficiently contracting and rising on the skin-contacting surface of the napkin. In consequence, there is a risk

that the flaps might be incapable of reliably preventing menstrual discharge from leaking out the sides when worn.

In view of the problem as mentioned above, it is a principal object of the invention to solve this problem by folding the napkin in three along folding lines transversely extending across elastically stretchable sections of respective flaps so that a residual stress of folding may facilitate the elastically stretchable sections to contract even after the napkin has been unfolded to be worn by a wearer.

The object set forth above is achieved, according to the invention, by a sanitary napkin comprising a liquid-permeable topsheet, a liquid-impermeable backsheet, a liquid-absorbent core disposed between these two sheets and a pair of longitudinally stretchable barrier flaps provided on either

side of said napkin, and said napkin being folded in three layers by folding back longitudinally opposite end sections thereof along folding lines extending transversely of said napkin and then packaged in an envelope, wherein:

each of said barrier flaps comprises a longitudinally stretchable section and non-stretchable sections extending continuously from longitudinally opposite ends of said stretchable section; and

said stretchable section has a length of 37 to 70% with respect to the entire length of said sanitary napkin and said folding lines transversely extend across said stretchable section.

With the sanitary napkin arranged in this manner, the stretchable section of each flap tends to contract as the napkin is picked out from the envelope and longitudinally unfolded. More specifically, the napkin folded in three layers has a residual stress of folding along the folding lines, under the effect of which, when the longitudinally intermediate section of the folded napkin is placed on a horizontal surface, the longitudinally opposite end sections of the napkin is unfolded in a slightly raised state. At the same time, the stretchable section of each flap contracts between its longitudinally opposite ends and rises above the

skin-contacting surface of the napkin.

Fig. 1 is a perspective view of an individually packaged sanitary napkin;

Fig. 2 is a plan view showing an unfolded sanitary napkin as partially broken away;

Fig. 3 is a sectional view taken along a line X - X in Fig. 2;

Fig. 4 is a perspective view of a sanitary napkin placed on a horizontal surface; and

Fig. 5 is a sectional view taken along a line Y - Y in Fig. 4.

Referring to Fig. 1, a sanitary napkin 1 is formed longitudinally and folded in three layers and individually packaged in an envelope 2. Referring to Fig. 2, the sanitary napkin 1 is removed from the envelope 2 and horizontally unfolded. The napkin 1 comprises a liquid-permeable topsheet 3 made of a nonwoven fabric of thermoplastic synthetic fibers, a liquid-impermeable backsheet 4 made of a thermoplastic synthetic resin film and a liquid-absorbent core 5 made of a mixture of fluff pulp and super absorbent polymer powder and disposed between these two sheets 3, 4. The top- and back sheets 3, 4 are water-tightly bonded together in the area extending outward beyond the

peripheral edge of the core 5 so as to define longitudinally opposite end flaps 6 having no stretchability and transversely opposite side flaps 8. A skin-contacting surface of the topsheet 3 in each side flap 8 carries thereon a barrier flap 10 having an intermediate section 24 adapted to be elastically raised against a wearer's skin, as will be described below more in detail.

Longitudinally opposite (upper and lower as viewed in Fig. 2) end portions 14, 15 of the napkin 1 are folded inward along imaginary lines 12, 13 longitudinally dividing the napkin 1 into three substantially equal parts so that the end portions 14, 15 may be placed one upon another with the topsheet 3 lying inside, and the napkin 1 thus folded in three layers is individually packaged in the envelope 2 shown by a broken line in Fig. 1. A flap 27 of the envelope 2 may be opened in the direction as indicated by an arrow A to remove the napkin 1 therefrom.

The barrier flap 10 comprises an oblong sheet of liquid-impermeable or water-repellent nonwoven fabric made of thermoplastic synthetic fibers and an elastic member 20 adhesively bonded under tension to the inner side of a side edge 19 defined by folding said sheet. The barrier flap 10 is thus defined by the free side edge 19, a side edge 19A

opposed to the free side edge 19 and bonded to the flap 8 by means of linearly applied hot melt adhesive 17, longitudinally opposite non-stretchable end sections 22, 23 fixed to the flap 8, and a stretchable intermediate section 24 extending between these longitudinally opposite end sections 22, 23. The flap 8 and the barrier flap 10 associated with this flap 8 are fused together by heat embossing them at the longitudinally opposite end sections 22, 23 of the barrier flap 10 to enhance their rigidity so that the end sections 22, 23 never contract even if these end sections contain therein the elastic member 20.

As will be apparent from Fig. 2, the lines 12, 13 along which the napkin 1 is folded in three layers transversely extend across the barrier flap 10 at its intermediate section 24 preferably at a distance of 10mm or longer from the inner ends 22A, 23A of the longitudinally opposite end sections 22, 23, respectively.

Referring to Fig. 3, with the napkin 1 horizontally unfolded, the intermediate section 24 of the flap 10 is shown in a flat state.

Referring to Fig. 4, the napkin 1 has been removed from the envelope 2 and placed on a horizontal surface. Even after the napkin 1 has been unfolded, there remains along the

lines 12, 13 residual stress of folding and, when a section extending between the folding lines 12, 13 is horizontally placed, the longitudinally opposite end sections 14, 15 slightly rise on these folding lines 12, 13. In this state of the napkin 1, distance in a straight line between the  
5 respective inner ends 22A, 23A of the longitudinally opposite end sections 22, 23 of the flap 10 becomes shorter than in the napkin 1 horizontally unfolded (Fig. 2) and the intermediate section 24 of the flap 10 correspondingly contracts. Consequently, the side edge 19 and portion adjacent this side edge 19 rise on the skin-contacting surface of  
10 the napkin 1.

Referring to Fig. 5, the flap 10 rises at its intermediate section as well as the portion adjacent this to form a barrier serving to prevent menstrual discharge from leaking out the sides. While the arrangement is shown with the side edge 19 lying on the outside and the side edge  
15 19A opposed to the side edge 19 to the inside, it is also possible to arrange so that the side edge 19 lies inside. The longitudinal dimension of the intermediate section 24 is preferably 37 to 70% and more preferably 40 to 65% with respect to the entire length of the napkin 1. If less than 37%, the entire length of the intermediate section 24 will be  
20 substantially equal to or



less than the distance between the folding lines 12, 13 and it will be very difficult or quite impossible to obtain the expected effect of folding the napkin 1. If 70% or longer, on the other hand, it will be required to bond the elastic member 20 to the flap 10 with a relatively high tension, i.e., a relatively high stretching ratio to achieve sufficient contraction of the intermediate section 24 or this intermediate section 24 will slacken and often fail to rise. However, increased stretching ratio will disadvantageously impair softness and uncomfortably stimulate the sensitive part of a wearer.

10 By utilizing the residual stress of folding remaining in the napkin 1 along the lines 12, 13 to contract the intermediate section 24 of the barrier flap 10, an effective barrier can be reliably formed. In other words, the contractile force of the flap 10 can be minimized sufficiently to soften the contact of the flap 10 with the sensitive part of a wearer and  
15 thereby to improve comfortableness to wear.

For the individually packaged sanitary napkin 1 according to the invention, the top- and backsheets 3, 4 as well as the core 5 may be made of materials usually employed in this field of industry to make these members. Bonding or fixation of the respective members may be  
20 achieved by using



hot melt adhesive or heat seal technique, and such bonding technique may be used instead of the previously mentioned heat-embossing. It is also possible without departing from the scope of the invention to form the flap 10 by a rubber sheet or stretchable nonwoven fabric and thereby to eliminate use of the elastic member 20 or to limit the extent over which the elastic member 20 should be bonded to the intermediate section 24.

Though not shown, at least the core 5 may be provided on its top surface with compressed grooves each presenting a concave (preferably, V-shaped) cross-section extending along the respective folding lines 12, 13 not only to assist contraction of the barrier flap 10 but also to suppress diffusive permeation of menstrual discharge toward the longitudinally opposite end sections 14, 15. Furthermore, the intermediate section 16 may be also provided at least along its middle line with a similar compressed groove connected to said transverse grooves formed in the top surface of the core 5 to enhance the above-mentioned function.

According to the invention, the sanitary napkin 1 is folded in three layers along the lines transversely extending across the stretchable section of each barrier flap and

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individually packaged in the envelope, so the residual stress of folding functions to facilitate contraction of the stretchable section and thereby to reliably form the barrier preventing menstrual discharge from sideways leaking.

WHAT IS CLAIMED IS:

1. A sanitary napkin comprising:
  - a liquid-permeable top sheet;
  - a liquid-impermeable back sheet;
  - 5 a liquid-absorbent core disposed between said top and said back sheet;
  - first and second longitudinally stretchable barrier flaps alongside said core at first and second sides, respectively, of said sanitary napkin;
  - said first and second barrier flaps being affixed along an inner edge
  - 10 to said top sheet, an outer edge of said first and second barrier flaps being free to rise inwardly from said top sheet;
  - first and second transverse fold lines on said sanitary napkin permitting upper and lower end portions of said sanitary napkin to be folded over an intermediate portion thereof;
  - 15 longitudinally stretchable portions of said barrier flaps being from about 37 to about 70 percent of a length of said sanitary napkin;
  - said first and second fold lines extending across longitudinally stretchable portions of said first and second barrier flaps; and
  - said longitudinally stretchable portions being short enough, relative
  - 20 to length of said napkin, to soften contact of said first and second barrier flaps with a sensitive part of a wearer, thereby improving wearer comfort.
2. A sanitary napkin according to claim 1, wherein said first and second fold lines are spaced at least 10 mm from ends of said
- 25 longitudinally stretchable section.
3. A sanitary napkin according to claim 1, wherein:

said napkin includes first and second non-stretchable side flaps at least along outer side edges of said first and second sides;

said inner edge of said first and second barrier flaps affixed to said first and second non-stretchable side flaps, respectively.

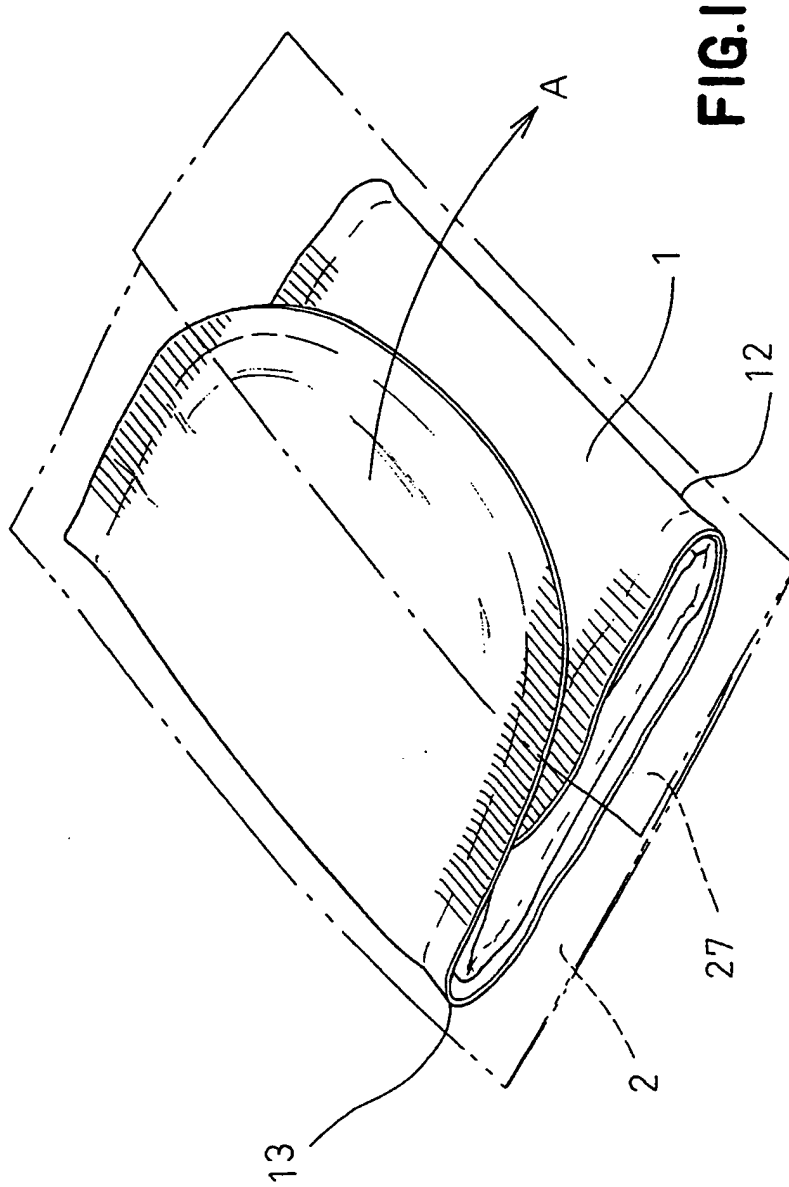
- 5        4.     A sanitary napkin according to claim 1, wherein at least said core includes a plurality of compressed grooves along each of said first and second fold lines.

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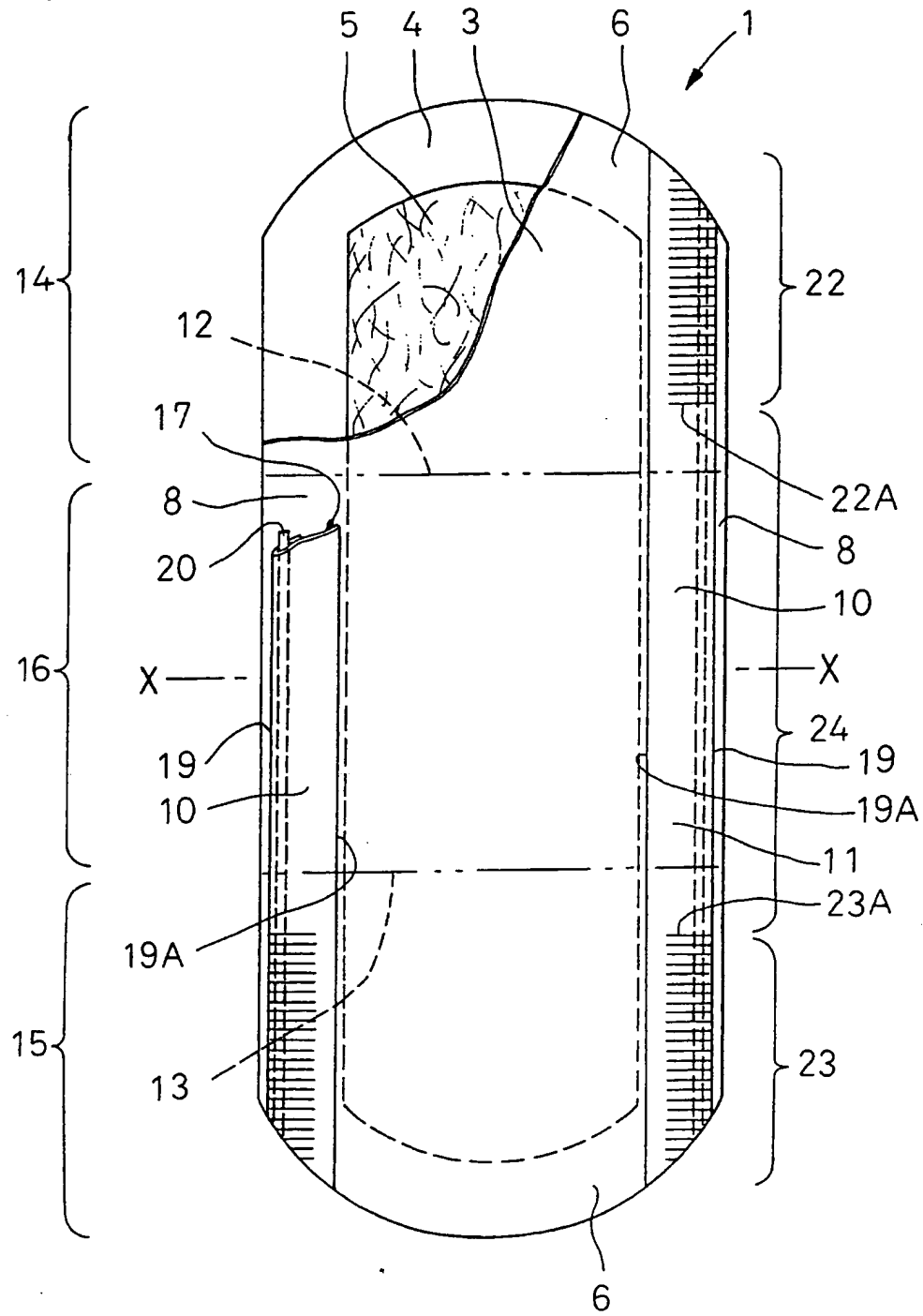
SANITARY NAPKIN

A B S T R A C T

A sanitary napkin comprising a pair of longitudinally stretchable barrier flaps provided on either side thereof, said napkin being folded in three layers by folding back longitudinally opposite end sections thereof along lines extending transversely thereof as well as transversely extending across said barrier flaps, and said napkin being packed in an envelope.



**FIG.2**





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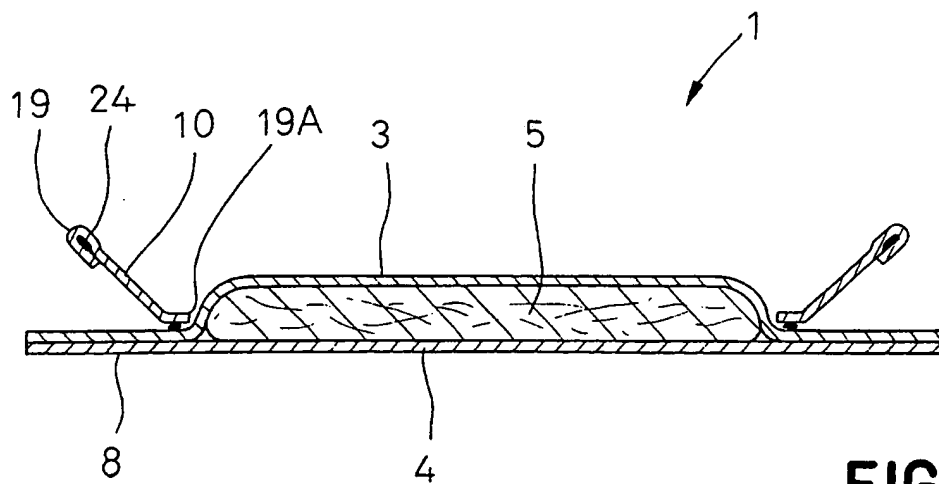
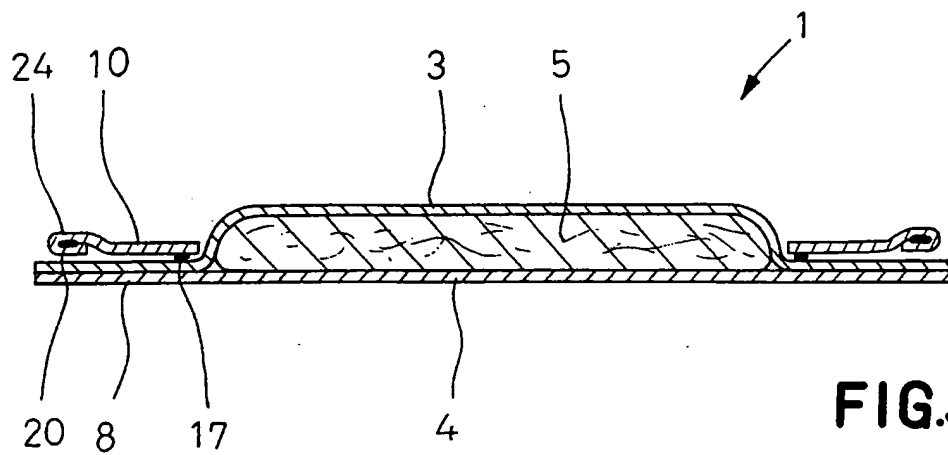


FIG. 5

**FIG. 4**

